

processor signals which correspond to the captured audio signals, the local processor transmitting extracted feature signals to the recognition server, the code causing the recognition server to perform the steps of:

A1 receiving the extracted feature signals from the local processor through an interface;

storing a plurality of feature signal sets in a memory, each set corresponding to an entire audio work; and

with processing circuitry (i) receiving an input audio stream and separates the received audio stream into a plurality of different frequency bands; (ii) forming a plurality of feature time series waveforms which correspond to spectrally distinct portions of the received input audio stream; (iii) storing in the memory the plurality of feature signal sets which correspond to the feature time series waveforms, (iv) comparing the received feature signals with the stored feature signal sets, and (v) providing a recognition signal when the received feature signals match at least one of the stored feature signal sets.

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A2 85. (Once Amended) A business method according to Claim 84, further comprising the steps of:

receiving payment authorization from said user; and  
in response to the authorization, forwarding the audio work which corresponds to the at least one of the audio

A2 templates stored in the recognition site memory to the user.

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Kindly add new Claims 86-137 as follows:

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86. Apparatus for recognizing free-field audio signals, comprising:

A3 a hand-held device having a microphone to capture free-field audio signals;

a local transmitter, integral to said hand-held device, to transmit a signal corresponding to the captured free-field audio signals to a recognition site;

said local transmitter further comprising an analog-to-digital converter to convert the free-field audio signal to a digital format; and

a recognition processor and a recognition memory at the recognition site, said recognition memory storing data corresponding to a plurality of audio templates, said recognition processor comparing the signal transmitted from said local transmitter with at least one of the audio templates stored in said recognition processor memory, said recognition processor providing a recognition signal based on the comparison.

87. The apparatus of claim 86 further comprising a local receiver integral to said hand-held device for receipt of said recognition signal.

88. The apparatus of claim 87, wherein said recognition signal is transmitted to said local receiver by a communication protocol selected from the group consisting of frequency division multiple access, time division multiple access, cellular digital packet data, global system for mobile communications and code division multiple access.

89. The apparatus of claim 87, wherein said local receiver further comprises a display device to display metadata associated with said recognition signal.

90. The apparatus of claim 86 wherein said local transmitter transmits to said recognition site by a communication protocol selected from the group consisting of frequency division multiple access, time division multiple access, cellular digital packet data, global system for mobile communications and code division multiple access.

91. The apparatus of claim 86, wherein said hand-held device comprises a cellular phone.

92. The apparatus of claim 86, wherein each said audio template corresponds to at least one of a song, advertisement, TV program, and radio program.

A3 93. The apparatus of claim 89, wherein said metadata comprises at least one selected from the group consisting of song title, album title, author, singer, date of creation and artist name(s).

94. The apparatus of claim 89, wherein said metadata comprises at least one selected from the group consisting of advertisement ID, advertisement source, advertisement ownership and advertisement sponsorship.

95. The apparatus according to claim 86, wherein said free-field audio signal corresponds to at least one of a radio broadcast signal of a song, a TV program, an advertisement and a locally generated audio signal.

96. The apparatus according to claim 86, wherein said free-field audio signal is transmitted over the internet and said free field audio signal corresponds to at least one of a song, a TV show, a video file, an advertisement and a movie.

97. The apparatus according to claim 86, further comprising a signal filter arranged to substantially reduce or eliminate background noise from said free-field audio signal.

98. The apparatus according to claim 97, wherein said signal filter is integral to said hand-held device.

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99. The apparatus according to claim 97, wherein said signal filter is coupled to said recognition processor.

100. The apparatus of claim 86, further comprising an error detection means for determining said free-field audio signal is corrupted.

101. The apparatus of claim 100, further comprising an error transmission means for transmitting an error message to said hand-held device.

102. The apparatus of claim 86, wherein each said audio template uniquely identifies at least one of a song, advertisement and TV program.

103. The apparatus of claim 86, wherein said recognition memory is a relational database for identification of songs.

104. A method of identifying information associated with an audio signal comprising the steps of:

establishing a connection between a hand-held device and a recognition site;

A3 transmitting a sample signal corresponding to the audio signal over said connection;

creating a unique audio template from said sample signal by applying a predetermined algorithm whereby said unique audio template is smaller than said sample signal;

comparing said unique audio template with a plurality of audio signatures stored on said recognition site, said plurality of audio signatures being created by application of said predetermined algorithm to a plurality of predetermined source signals;

determining the identifying information associated with the audio signal based on the comparison of said unique audio template with said plurality of audio signatures; and

transmitting the identifying information to said hand-held device over said connection.

105. The method according to claim 104, wherein said audio signal comprises at least one of a broadcast of a song, a TV program, an advertisement and a locally generated audio signal.

AB 106. The method according to claim 104, wherein said hand-held device comprises a cellular phone.

107. The method according to claim 106, wherein the step of establishing a connection comprises the step of dialing a phone number associated with said recognition site.

108. The method according to claim 106, wherein the step of transmitting a sample signal further comprises the step of placing the microphone of said cellular phone near a source of said audio signal.

109. The method according to claim 104, wherein said source of said audio signal comprises at least one selected from the group consisting of a radio, a TV, a computer and a local source.

110. The method according to claim 104, wherein said connection is wireless.

111. The method according to claim 104, wherein said recognition site further comprises a relational database associated with said plurality of audio signatures.

AB 112. The method according to claim 104, wherein said predetermined algorithm produces a respective code used to uniquely identify each said audio template.

113. The method according to claim 104, wherein said predetermined algorithm produces a respective code used to uniquely identify each said source signal.

114. The method according to claim 104, wherein said predetermined algorithm produces a respective code used to uniquely identify each said source signal and each said audio template.

115. The method according to claim 104, wherein said connection comprises a communication protocol selected from the group consisting of frequency division multiple access, time division multiple access, cellular digital packet data, global system for mobile communications and code division multiple access.



116. The method according to claim 104, further comprising the step of filtering out background noise associated with said sample signal.

117. The method according to claim 116, wherein the step of filtering out the background noise is performed by software code associated with said hand-held device.

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118. The method according to claim 116, wherein the step of filtering out the background noise is performed by software code associated with said recognition site.

119. The method according to claim 116, wherein the step of filtering out the background noise is performed by circuitry associated with said hand-held device.

120. The method according to claim 116, wherein the step of filtering out the background noise is performed by circuitry associated with said recognition site.

121. A hand held device for the transmission of a signal corresponding to a free-field audio signal to a recognition site comprising a recognition processor and a recognition memory, the recognition memory adapted to store data corresponding to a plurality of audio templates, and the recognition processor adapted to compare the signal to at

least one of the audio templates, said hand held device comprising:

a receiving means for receipt of the free-field signal;

an analog to digital converter to convert the free-field audio signal to a digital format; and,

A3 a transmitter, integral to said hand-held device, to transmit said signal corresponding to the captured free-field audio signals to the recognition site.

122. The hand held device of claim 121, wherein said receiver means is a microphone.

123. The hand held device of claim 121, further comprising a radio receiver for receipt of a signal caused to be generated by the recognition site.

124. The hand held device of claim 123, further comprising a display means for display of a message associated with the signal caused to be generated by the recognition site.

125. The hand held device of claim 124, wherein said display means comprises an LCD.

126. The hand held device of claim 121, further comprising a signal filter adapted to substantially reduce or eliminate background noise from the free-field audio signal.

AB 127. The hand held device of claim 121, wherein transmission of the signal from the hand held device to the recognition site is by a communication protocol selected from the group consisting of frequency division multiple access, time division multiple access, cellular digital packet data, global system for mobile communications and code division multiple access.

128. A recognition site adapted to process signals corresponding to free field audio signals transmitted from a hand-held device comprising:

a receiving means for receipt of a signal from the hand-held device;

a memory means for storing a plurality of audio templates;

a processing means for comparison of said signal to at least one audio template; and

a signal generation means for transmission of a signal to the hand held device corresponding to the comparison performed by said processing means.

A3 129. The recognition site of claim 128, wherein said memory means comprises a database containing a sample signal corresponding to a respective song and metadata associated with said song.

130. The recognition site of claim 128, wherein said memory means comprises a database containing a sample signal corresponding to a respective advertisement and metadata associated with said advertisement.

131. The recognition site of claim 128, wherein said memory means comprises a database containing a sample signal corresponding to a respective television program and metadata associated with said television program.

132. The recognition site of claim 129, wherein said metadata comprises at least one of a song title, artist's name, album title, author, singer, and date of creation.

133. The recognition site of claim 130, wherein said metadata comprises at least one of an advertisement ID, source, sponsorship and ownership.